

BRILLIANT Warriors

By JAY W. KELLEY

There is little doubt that military education is an important complement to military training. But while everyone would agree on the value of both training and education to the Armed Forces, just how much professional military education (PME) a warrior needs, its form and timing, and the impact of information technology on what is taught is open to debate. This article seeks to animate and encourage that exchange.

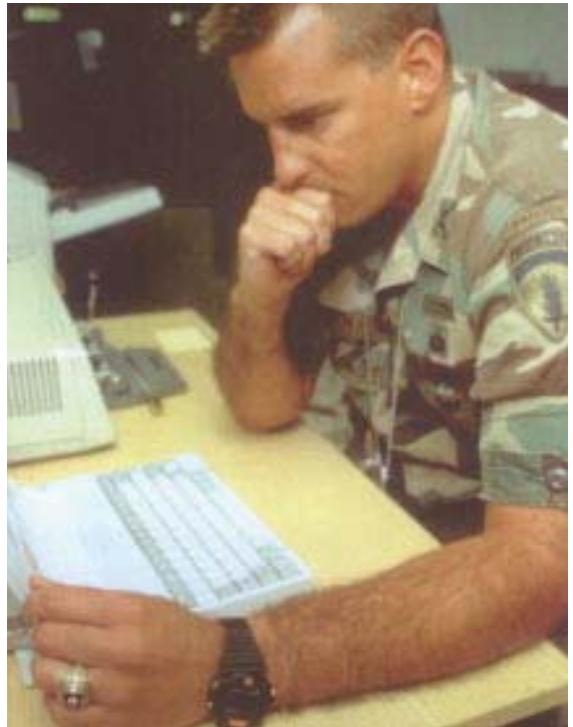
One thing is certainly undeniable: people are the most critical element in the military. They must fight our wars. Technology provides the tools to fight, and training enables a warrior to use them to his best advantage. And the purpose of PME is to leverage the most powerful factor in the warfighting equation: the human mind. Our training institutions and their capabilities are superior. Training has repeatedly reengineered itself to take account of advances in information technology, simulation, and discoveries about how mature students learn best. It is

If we should have to fight, we should be prepared to do so from the neck up, instead of from the neck down.

—Jimmy Doolittle

challenging, experiential, and sometimes fun. But PME has not even kept abreast of improvements in training, let alone with needs of national military strategy.

Unless PME better prepares warriors, our best training may be wasted. To understand the changes that must be made in PME, we must differentiate between training and education.



U.S. Air Force (Ken Wright)

Training and Education

Military training and PME do not aim at providing jobs or adventures. They are necessary for success in warfare. Training creates competence in using machines or tools required for tasks. It is about teaching things that are known and using things that operate mechanically, electrically, or somewhat predictably. Education, on the other hand, aims at teaching intellectual constructs and appropriate principles so that the right tools are available and can be selected to achieve a desired effect. It is about learning whatever we do not know but envision we must know to survive and succeed. Said another way, training teaches the archer how to use the bow and arrow—how to aim the right arrow at the right bull's-eye. Education ensures that the archer also sees the value of gunpowder as an improvement over archery. The test of training is competence in environments that exist now and are understood. The test of education is success in different environments that are perhaps not fully understood.

Over the last several years, Air University has engaged in studies of the future. Spacecast 2020 is being followed by Air Force 2025, which is being conducted at the direction of the chief of staff,

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U.S. Air Force. The latter study examines the air and space capabilities that the Nation will need, systems and technologies that might contribute

to them, and concepts of operations for best utilizing new capabilities. Closely related are DOD studies and

seminar wargames that explore the revolution in military affairs (RMA). Each service and the Joint Staff are looking into the future to understand the operating environments that the Armed Forces might face.

Alternate Futures

Moving into the future, Carl Builder has reminded us, is like driving into fog.¹ Turning on the high beams to see specific objects only illuminates the fog more brightly. To make out shapes requires lower beams, peripheral vision, and the ability to observe relationships between shapes, the road ahead, and the means of illumination. It also requires making implicit assumptions about what is perceived explicit and then challenging them. The first thing one sees, to pursue Builder's analogy, is that there is more than one future visible in the fog. Each alternate future is internally consistent, often equally plausible, and could actually be the future. Some are benign while others are arduous. Combined, they delimit strategic planning, identify risks, and suggest challenges and opportunities that may lie ahead. Alternate futures are descriptive, and not predictive or normative. They are planning stories or scenarios. Aware of these alternatives, planners can ignore any or all. The objective is to clarify the shapes in the fog to reduce surprise and risk for decisionmakers.

Alternate futures need not be precisely right, just plausible and approximately right. This is preferable to stumbling along in the dark or clinging to the present and ultimately being ill-prepared for the unexpected. While a creative process, generating alternate futures is rigorous and exacting. Just as we know the past by inference, we can gain similar insight into futures. Businesses spawn alternate futures at great expense because they pay off. Failing to look ahead might lead to missing new customers or losing their market share. Militaries that do not look ahead may lose nations.

There are other methods for looking ahead besides alternate futures, some better than others. But all have a common objective: to provide insights into tomorrow so that our present actions can prepare us. Thus, the task is to look ahead, describe the operating environment, delineate the skills it may demand, and postulate actions likely to produce the desired results.²

Some things are common to all futures. Simply put, soldiers, sailors, marines, and airmen of 2020 must become as "brilliant" as their tools. For example, the Army mobile digitized Force XXI and the Marine Corps initiative Sea Dragon—or whatever they become on the way to the far future—can only be understood or prosecuted by thoroughly trained and superbly educated forces. Given the distinct possibility that nontraditional missions will increase, and that the Armed Forces are not likely to grow in size, the education and training hurdles that we face are immense.

What should planners study to enable them to devise simultaneous strikes on 5,000 targets with precision-guided munitions? What sort of education will prepare combatants to deploy from CONUS to link up with coalition forces to fight within twelve hours? How does one train marines to fight brush fires in California one week and survive firefights in combat the next?

The Environment

Studies indicate that the operating environment of the far future probably will include five attributes important to those who are planning military training and PME today.

Humans will still fight. Combat can occur anywhere from the earth's surface to cislunar space. It can break out in environments ranging from jungle to polar ice, from cities to orbital heights. It can involve national armies, irregular forces, terrorist groups, or organized crime. And even though nation-states will not wither away, they may have more powerful competitors in the future.

The military will be smaller. Capabilities will be more tightly integrated: speed, precision, and the expertise to operate in ambiguous circumstances will become treasured operational values. Cost will be as important as capability in organizing, training, and equipping this force.³ A cadre of nearly transcendent professionals—but not six-million dollar men or robocops—will constitute the force. The services probably will not be merged, and neither a space nor information corps is likely to be created. We will still need the means to develop experts in land, sea, and air and space warfare—including information operations that cut across all combat media. This force will work together with many members of the interagency community as well as contractors. All elements of this future force must understand their contributions and how other contributors are integrated to meet the objective. Knowing how one's own part of this force functions will not be good enough; one must know how others work too.

M-1 main battle tanks.



U.S. Marine Corps



F-117 Stealth fighter.

U.S. Air Force (Marvin Lynchard)

high ambiguity. Precision and engagement speed (strikes and restrikes) will compensate for smaller forces. Events will unfold so rapidly that time and timing become critical. The ability to act rapidly over great distances with a minimum of casualties or damage (including harm to the ecosystem), then withdraw or terminate quickly, may deter potential adversaries.

There will be myriad interactive smart machines. The explosion in information technology, according to Carl Builder, is the key disturber of our time. "Brilliant" systems—many small—are inescapable consequences of an eruption in computing power as well as information technologies. Microchips could turn up in almost anything by the middle of the next century, which would make "dumb" things smarter. Microchips communicating with a central processing unit will constitute a smart network. And when smart networks communicate, almost brain-like systems will emerge. Admiral William Owens and others have referred to such an occurrence as a coming "system of systems." In thirty years intelligence will be embedded in most things, many interacting with humans. Thus it is likely that the Armed Forces could ultimately become an "organism of organisms."

Coalitions will be the norm. Technology and a common dedication to improving quality of life will combine to shrink the planet and harmonize

The standard for this force will be its ability to make rapid precision strikes, both physical and electronic-photonic, and operate in situations of

interests without a loss of cultural or national identity. Electronic linkages among economies, increased leisure and business travel, and ease of interpersonal contacts will facilitate greater cooperation. Threats to one global partner will imperil others more than today. Yet military-to-military exchanges, coalition training exercises, and actual operations will link allied warriors and promote a kindred spirit among them. We should preserve the capability to act unilaterally, but—like it or not—coalition operations will be the norm.

Tomorrow's subordinates and leaders will be different. The same genetic material will be influenced by a vastly different environment. By early in the next century both leaders and the led may appear as different from our perspective as those of 1965 appear to us now.

By 2025 we will have been joint for nearly fifty years, and the speed bumps of today will have been flattened. The demographic composition of Congress will be different. Whereas less than 40 percent of current members have served in the Armed Forces, the percentage may be much smaller over next thirty years. A significant aspect of continuity is that the military will obey the President, respect the Constitution, and operate under the control of civilian authority.

*If you tell me, I'll listen.
If you show me, I'll see.
If I experience it, I'll learn.*

—Lao Tze

Determining the Output

Given the likely attributes of the future environment, we must examine the desired output as a prelude to describing the input and the contribution of training and education. What skills and

actions are needed in a world with these attributes? In the most compressed terms possible, education must help military professionals acquire a variety of knowledge, skills, and attitudes.

A constantly improving understanding of human motives and interpersonal skills necessary to achieve cooperation. In other words, the essence of leadership may be perceiving what makes people tick. Understanding how human beings of different

backgrounds and cultures (or services) act in different circumstances is integral to understanding the sources and nature of cooperation, friction, and conflict among people. Military professionals in the far future must learn more about leadership and human behavior—their own as well as that of their subordinates and adversaries.

A strong commitment to right conduct that almost invariably results in right behavior. Note the qualifier “almost.” Because human nature will not change, and freedom to choose is important, there will be misconduct and mistakes in spite of our best efforts. In thirty years democracy will evolve, but it will remain based on a passion for individual liberty and the belief that people ought to respect the rule of law. As public servants in a society that cherishes a free press, we will come under closer scrutiny than today. Erosion of public support may be worse than defeat in battle. Education can provide confident assurance of virtue, right conduct, and fidelity to core values.

The eagerness to discover new tools, the ability to find inventive uses for existing tools, the initiative to innovate, and the ability to know—as well as the willingness to take—acceptable risks. The tools and machines available for everything, including fighting, may be as numerous in the far future as they are marvelous. Comparing technologies of 1965 with those of today, space systems (except for spacelift), stealth, and sensor improvements stand out as initially military innovations. Strong advances in information, biochemistry, and medicine were developed by the private sector. Yet warriors of 1996–2025 must have the knowledge and incentive to identify and select emerging developments that can enable dominant military capability: basic science (chemistry and physics), pharmaceuticals, electronics, air and space, and information technology. We need to know more about space operations since our quality of life and success in battle will increasingly rely on them.

Certainly areas of technical competence that training must provide will be more numerous, but

education aims at big constructs acquired in complicated ways. Knowing the environment and the desired output, what then is the input? The President of 2025 may be attending high school at present. The Chairman and service chiefs of the far future are cadets or midshipmen, lieutenants or captains today. The environment and experiences which form them will be significantly different. We thus begin with a different input: different people with a different orientation.

The 13th Generation

Differences in this generation are marked.⁴ They are the first to grow up with television and mature with computers, video games, and portable communications devices. They are fitter and healthier and destined to live longer. They care for the planet and the environment. They have experienced more (earlier) than previous generations. They demand stimulation, excitement, and fast paces in their lives. They seek diversity. They will enter the Armed Forces for challenges and responsibilities unavailable elsewhere. What should PME offer these leaders of the next century?

One answer is to ignore their differences and force them into the mold of traditional PME; an environment, John Warden once said, in which “Socrates would be comfortable.” However, they will come to our hallowed halls already trained and will expect no less challenge in education. The traditional approach is not likely to work. Rather, PME must come at the right time, offer the right experience, point to the right information, provide a nearly risk-free laboratory to innovate, apply technology to unusual conditions, make connections, and reach conclusions that can be tested. If we can envision alternate futures, we can employ technology to create them as virtual realities. If we can use technology to teach students to operate in them, we can prepare them to cope with the real future. The role of tomorrow’s professional military educator is thus more important, not less. Those responsible must, in short, prepare each of their charges to be a “brilliant warrior.”

Brilliant means training and educating people committed to the warrior ethic in such a way that by 2025, compared to today, they will be smart, adept, agile, savvy—professional warriors. They should have the attributes to survive, succeed, and lead others in whatever future presents itself. They must be lifelong learners, thinkers, and prudent risk-takers. Our gift to them will be a PME system that forces them to think, encourages them to learn how to learn, and gives them the confidence to perform in new operating environments.

Remember that there will be fewer warriors in the future and that cost will rival capability as

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a criterion for organizing, training, and equipping them. Two standards for evaluating PME are *effectiveness*—when the desired knowledge is achieved and right actions result—and *cost*—when the highest value is acquired and best return on an investment occurs. Both must be applied with an awareness of the changes that will unfold naturally between now and the far future. The debate has begun, now it must be enlivened.

Forming Brilliant Warriors

Alternatives for meeting specific knowledge and behavioral objectives are many. Choosing will define their characteristics; but a PME system must also choose its general characteristics. The process of choosing is difficult: there are public laws to be satisfied; the Joint Staff is involved; and services, training commands, and using commands participate. Strategy reviews, force structure, roles and missions commissions, and new legislation will also affect choices.

As the Armed Forces integrate and the defense establishment shrinks, there will be efforts to reduce infrastructure costs and investment. Today, each service has both a command and staff and a war college. Tomorrow, service competencies may be taught by robust departments on one campus—a move that the British are making.

Another alternative is to combine all the intermediate and senior colleges into one school for each service and transform the National Defense University into

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alone educators**

a PME institution for general/flag officers. Currently, warriors are likely to attend both staff and war college, spending twenty or more months in residence. Tomorrow, resident study may be much briefer. Today, selection for resident PME is the responsibility of the services. Tomorrow, joint selection boards may identify officers for schooling.

At present PME is technology-poor. In the future, and if the private sector is encouraged, it could have powerful technologies which could create different virtual realities and use resident PME as the crucible for learning experiences that may not be duplicated in or provided to the field.⁵ For example, we might want a warrior to experience operating in a known environment such as Somalia or Bosnia. But we may also want to create a less certain or future environment.

PME is discontinuous and episodic. Resident and non-resident programs in the future may find warriors engaged in a deliberate life-long learning

process. Whereas today many civilians at PME institutions may have tenure, tomorrow they may be contract employees, visiting scholars, and former warriors. Today, curricula are built around Clausewitz, Mahan, and the great captains. Tomorrow, curricula may provide stressful experiences in virtually real leadership situations and use joint doctrine and combined arms in coalition wargames, along with instruction on ethics and area studies. Envisioning, creating, and teaching such curricula requires competent educators.

These and other challenges await us all: Congress, special commissions, the Office of the Secretary of Defense, Joint Staff, unified commands, services, training and education commands, and troops. Those with responsibility for PME should remember Ervin Rokke's tongue-in-cheek challenge: "As academies, we will advise others to change but will likely ensure that revolutionary change takes place most slowly within our own organization."⁶ This will not suffice. If we fail to adapt and innovate, we are not fit to be leaders, let alone educators.

Characteristics of PME

Even as general characteristics of a system to produce brilliant warriors are being chosen, specific choices must be made. These elements, like the general ones, must satisfy certain criteria. I proposed effectiveness and cost. The aim is to bring the powerful learning experiences of life, leadership, and warfare to PME. Experience may remain the best teacher. Given such objectives, what are the alternatives? The answers are hypotheses which should be tested and debated.

A constantly improving understanding of human motivation and interpersonal skills is necessary to achieve cooperation to attain the desired objective or effect.

- more psychology, anthropology, or social science?
- interactive learning with artificial intelligence as a tutor or more classroom teachers?
- virtual reality systems that allow the student to live in future environments?
- more role-playing, case studies, biography?
- increased international officer and civilian enrollment?
- more theoretical models to study and evaluate?
- more virtual travel or military-to-military exchanges?
- studies of mathematics and chaos theory?
- multidisciplinary teaching teams?
- more history or less?

Educating brilliant warriors requires that distance learning expose the leaders to continuous PME. Yet even distance learning must be tiered so that everyone receives a customized curriculum

USS Independence.

U.S. Navy (Independence Photo Lab)

with more eager students receiving a more challenging course of studies. Some warriors, although in PME, may remain at the "maintenance" level for their entire careers. Only those demonstrating command potential will attend resident PME. It need not last a year or occur at traditional sites. It could be a series of short resident learning opportunities. These would aim to provide experiences that distance learning cannot. Foremost among them is performing in stressful circumstances of alternate futures. Thus, resident PME must begin to offer a more experiential curriculum that bears on conflict, human relations, and military leadership. Knowledge is about making connections and choices, so the approach must be multidisciplinary and multicultural. More international officers and civilians must participate. One sort of learning opportunity in residence for air officers might focus on joint and coalition air and space operations in an alternate future environment. A different type for naval officers would allow them to experience that operational environment. These PME learning opportunities might occur several times a year between the 10- and 15-year point in their

careers—some intentionally on short notice—to prepare the warrior for senior command and staff responsibilities. Exceptionally well qualified officers, as indicated by their selection for general or flag rank, would go on to a National Defense University of the future just past the 20-year point.

A strong commitment to right conduct that almost invariably results in right behavior.

- more ethics education or less?
- deeper study into the American system of government?
- a curriculum requiring difficult personal resource allocation choices?
- placing students in alternate future environments with high ambiguity and uncertainty?
- more health and fitness activities or less?
- more, fewer, or no seminars?
- more or less reading and writing?
- more personal mentoring or less?

Richard Kohn of the University of North Carolina and others have expressed concern over the current state of civil-military relations in this country.⁷ For America to maintain its position in the world, our leaders must appreciate national ideals, how government and decisionmaking work, and the Constitution. Moreover, they must be educated in the core values of their services as

well as professional ethics. It is on these foundations that distance learning in the next 5 to 10 years ought to be built, since civilian institutions may not sufficiently emphasize them for warriors. In any event, education must broaden awareness of possible future challenges, and technology could allow warriors to experience them by performing in virtually real futuristic environments.

The eagerness to discover new tools, the ability to think creatively of new uses for existing tools, the initiative to innovate, and the ability to know—and willingness to take—acceptable risks.

- a wargame, research, or book-centered curriculum?
- more studies on the relationships between technology and war or less?
- formal education and experience in creative thinking?
- formal education in logic, rhetoric, and critical thinking?
- a mandated or self-selected curriculum?
- opportunities to experiment with and fight different force structures?
- formal education in operations research and operations analysis?
- more emphasis on the sources of conflict and change or less?

Brilliant warriors must be critical thinkers. I.B. Holley of Duke University has identified the lack of education in critical thinking as a serious shortfall in today's PME curricula. Such skills are enhanced by a curriculum that emphasizes research. The French use a research-centered model in senior joint PME. Research into the past may be less germane to brilliant warriors than creative and disciplined thinking about the future, although studying the past warns us against repeating its mistakes. More and better wargames (including analytical ones) are needed to bolster curricula to improve critical and creative thinking. The study of joint matters—of the JOPES variety—which is not educational, does not require critical thinking, and clutters senior PME curricula today, would fill the 10- to 15-year interval of continuous distance learning. Readings and interactive discourse in strategy and history, making use of advanced distance learning, would offer basic discernment for warriors who lead warriors. Performance in distance learning programs should be a factor in selection for resident PME.

As critical components of national security strategy, military training and PME intersect the interests of three of our most conservative institutions: the military, academe, and the bureaucracy. These institutions are not so much adverse to change as they are slow to change and quick to resist unnecessary change. We have the brilliant educators to help produce brilliant warriors, but we lack a vision of where we want PME to go and what we want it to be. While classrooms may be wired and students may be issued laptops, these developments could be little more than natural, although unimaginative, improvements without vision.

There is no time like the present to begin thinking and debating changes necessary to keep PME relevant and valuable. The future, whatever it proves to be, will be our measure. Unless we act now, thinking about the future will become so much intellectual arm-waving. We will not have brilliant warriors to face tomorrow unless we prepare today. This discussion suggests some ways, but they are not the only ones. We cannot dodge the obligation to choose: PME will change. That being the case, we must choose wisely. **JFQ**

NOTES

¹ Carl Builder, "Guns or Butter: The Twilight of a Tradeoff?" paper presented to the Air University National Security Forum, Maxwell Air Force Base, May 1995.

² Richard C. Chilcoat, "The 'Fourth' Army War College: Preparing Strategic Leaders for the Next Century," *Parameters*, vol. 25, no. 4 (Winter 1995–96), pp. 3–17.

³ Gene McCall et al., *New World Vistas: Air and Space Power for the 21st Century*, summary volume (Washington: U.S. Air Force Scientific Advisory Board, 1995), pp. 4–5.

⁴ Neil Howe and William Strauss, "The New Generation Gap," *The Atlantic*, vol. 270, no. 6 (December 1992), pp. 67–89.

⁵ Nicholas Negroponte, *Being Digital* (New York: Vintage Books, 1995), pp. 116–28.

⁶ Conference Report: *Professional Military Education and the Emerging Revolution in Military Affairs*, SAIC document 95–6956, May 22–23, 1995.

⁷ Richard H. Kohn, "Out of Control: The Crisis in Civil-Military Relations," *The National Interest*, no. 35 (Spring 1994), pp. 3–17.